

**COMMONWEALTH OF VIRGINIA  
STATE IMPLEMENTATION PLAN REVISION  
FOR  
IMPLEMENTATION OF  
BEST AVAILABLE RETROFIT TECHNOLOGY  
  
STATE OPERATING PERMIT  
FOR  
Georgia Pacific  
Big Island**

Section 110 of the federal Clean Air Act prescribes the requirements for the contents, adoption and submittal of the state implementation plan (SIP). Section 110(a)(2)(D)(i)(II) requires that the plan contain adequate provisions prohibiting emissions in amounts which will interfere with measures required to be included in the plan to prevent significant deterioration of air quality or to protect visibility.

Part C (Prevention of Significant Deterioration of Air Quality) of § 160 establishes the purposes of the part as follows:

- (1) to protect public health and welfare from any actual or potential adverse effect which in the Administrator's judgment may reasonably be anticipated to occur from air pollution or from exposures to pollutants in other media, which pollutants originate as emissions to the ambient air, notwithstanding attainment and maintenance of all national ambient air quality standards;
- (2) to preserve, protect and enhance the air quality in national parks, national wilderness areas, national monuments, national seashores, and other areas of special national or regional natural, recreational, scenic or historical value;
- (3) to insure that economic growth will occur in a manner consistent with the preservation of existing clean air resources;
- (4) to assure that emissions from any source in any state will not interfere with any portion of the applicable implementation plan to prevent significant deterioration of air quality for any other state; and
- (5) to assure that any decision to permit increased air pollution in any area to which this section applies is made only after careful evaluation of all the consequences of such a decision and after adequate procedural opportunities for informed public participation in the decision making process.

Section 165 addresses the preconstruction requirements for major sources to be built in areas classified as PSD areas (federal class I areas). Section 165(b)(2) addresses the responsibility of the federal land manager that has authority over federal class I areas:

The Federal Land Manager and the Federal official charged with direct responsibility for management of such lands shall have an affirmative responsibility to protect the air quality related values (including visibility) of any such lands within a class I area and to consider, in consultation with the Administrator, whether a proposed major emitting facility will have an adverse impact on such values. . . . In cases where the Federal Land Manager demonstrates to the satisfaction of the state that the emissions from such facility will have an adverse impact on the air quality related

values (including visibility) . . . a permit shall not be issued.

Section 169(A) addresses visibility protection for federal class I areas:

Congress hereby declares as a national goal the prevention of any future, and the remedying of any existing, impairment of visibility in mandatory class I Federal areas which impairment results from manmade air pollution.

This section also provides timeframes by which the Secretary of the Interior and the Administrator will interact to assess visibility, develop federal regulations including specific source exemptions and public participation and the promulgation of those regulations.

Section 169(B) addresses the need for studies and assessment of current sources of visibility, impacts of other provisions, establishment of visibility transport regions and commissions, duties of the Administrator and the establishment of the Grand Canyon Visibility Transport Commission.

40 CFR 51.166, SIPs for new source review and source modifications, requires that the plans (in accordance with the policy of § 101(b)(1) and the purpose of § 160 contain emission limitations and such other measures as may be necessary to prevent significant deterioration of air quality.

Visibility is specifically addressed in 40 CFR 51.166(o), additional impact analysis:

(1) The owner or operator shall provide an analysis of the impairment to visibility, soils, and vegetation that would occur as a result of the source or modification and general commercial, residential, industrial, and other growth associated with the source or modification....

40 CFR 51.166(p) addresses sources affecting federal class I areas-additional requirements.

(p)(2) The Federal Land Manager and the Federal official charged with direct responsibility for management of Class I lands have an affirmative responsibility to protect the air quality related values (including visibility) of any such lands and to consider, in consultation with the with the Administrator, whether a proposed source or modification would have an adverse impact on such values.

On July 1, 1999, EPA published a final rule to address regional haze (64 FR 35714). The regional haze rule requires states to submit SIPs to address regional haze visibility impairment in federally protected parks and wilderness areas, which are known as “mandatory Class I federal areas” or “Class I areas.” The 1999 rule was issued to fulfill the requirements of §§ 169A and 169B. In this rule, EPA included a requirement for BART for certain large stationary sources that were put in place between 1962 and 1977. The regulatory requirements for BART were codified at 40 CFR 51.308(e) and in definitions that appear in 40 CFR 51.301.

Sections 169A(b)(2)(A) and 169A(g)(7) use the term “major stationary source” to describe those sources that are the focus of the BART requirement. To avoid confusion with other requirements which also use the term “major stationary source,” the regional haze rule uses

the term “BART-eligible source.” BART-eligible sources (i) have the potential to emit 250 tons or more of a visibility-impairing air pollutant, (ii) were in place between August 7, 1962 and August 7, 1977, and (iii) have operations that fall within one or more of 26 listed source categories. BART is required for any BART-eligible source which a state determines “emits any air pollutant which may reasonably be anticipated to cause or contribute to any impairment of visibility in any such area.” Accordingly, for stationary sources meeting these criteria, states must address the BART requirement when developing regional haze SIPs.

Section 169A(g)(7) requires that states consider the following factors in making BART determinations: (i) the costs of compliance, (ii) the energy and nonair quality environmental impacts of compliance, (iii) any existing pollution control technology in use at the source, (iv) the remaining useful life of the source, and (v) the degree of improvement in visibility which may reasonably be anticipated to result from the use of such technology. These statutory factors for BART were codified at 40 CFR 51.308(e)(1)(ii).

In response to various legal challenges, the D.C. Circuit Court issued a ruling in 2002 striking down the regional haze rule in part and upholding it in part. On July 6, 2005 (70 FR 39103), EPA promulgated final regulations to address the court’s decisions (40 CFR 51.302 and 51.308), and to provide BART determination guidance (Appendix Y to 40 CFR Part 51). The purpose of the guidelines is to assist states as they identify which of their BART-eligible sources should undergo a BART analysis, and select controls in light of the statutory factors (the BART determination).

Georgia Pacific Big Island, located in Bedford County, Virginia, has been identified as a source subject to the BART requirements. A legally enforceable mechanism (federally enforceable state operating permit) has been drafted to ensure compliance with the BART requirements and is included as Attachment A. Attachment B presents the statement of basis to support the terms and conditions of the permit, including the determination and analysis to support the BART determination for the control of visibility-impairing pollutants (particulate matter, nitrogen oxides, and sulfur dioxide) from the facility. The permit is being issued pursuant to Article 52 (9 VAC 5-40-7550 et seq.) of 9 VAC 5-40 (Existing Stationary Sources) and Article 5 (9 VAC 5-80-800 et seq.) of 9 VAC 5-80 (Permits for Stationary Sources) of state regulations and is federally enforceable upon issuance.

**LEGALLY ENFORCEABLE MECHANISM (PERMIT)  
TO ENSURE COMPLIANCE WITH BART REQUIREMENTS  
FOR**

Georgia Pacific  
Big Island, Virginia  
Registration No. 30389

Under the authority provided in 9 VAC 5-170-180 and Section II of Agency Policy Statement No. 3-2006 (dated October 20, 2006), the Director of the West Central Regional Office approved and issued the permit on #[date], to be effective that same day. The permit was approved and issued following the procedural requirements of Virginia's federally enforceable state operating permit program, Article 5 (9 VAC 5-80-800 et seq.) of Part II of 9 VAC 5-80 (Permits for Stationary Sources).

**STATE OPERATING PERMIT  
STATIONARY SOURCE PERMIT TO OPERATE**

**This permit implements the requirements for Best Available Retrofit Technology (BART).**

**Draft Permit Version for Public Comment**

This permit (i) is for the purpose of implementing the “best available retrofit technology” (BART) requirements of Article 52 (9 VAC 5-40-7550 et seq.) of 9 VAC 5-40 (Existing Stationary Sources) of the Regulations of the Board and (ii) establishes control technology and other requirements for the control of visibility-impairing pollutants from the GP Big Island, LLC in the West Central Air Quality Control Region. These BART requirements shall be the legal and regulatory basis for control of visibility-impairing pollutants from this facility.

In compliance with the federal Clean Air Act and the Commonwealth of Virginia Regulations for the Control and Abatement of Air Pollution,

GP Big Island, LLC  
9363 Lee Jackson Highway  
Big Island, Virginia 24526  
Registration No.: 30389  
AIRS ID No.: 51-019-0003

is authorized to operate equipment subject to Best Available Retrofit Technology (BART) requirements under 40 CFR 51, located at

9363 Lee Jackson Highway, Big Island, Virginia

in accordance with the Conditions of this permit.

Approved on                      **DATE.**

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David K. Paylor  
Director, Department of Environmental Quality

Permit consists of 7 pages.  
Permit Conditions 1 to 23.

**PERMIT CONDITIONS** - The regulatory reference or authority for each condition is listed in parentheses ( ) after each condition.

**Process Requirements**

1. **Equipment List** - Equipment to be operated under requirements for Best Available Retrofit Technology at this facility consists of the following:

<b>Equipment to be operated under Best Available Retrofit Technology</b>				
<b>Reference No.</b>	<b>Equipment Description</b>	<b>Rated Capacity</b>	<b>Federal Requirements</b>	<b>Installation Date</b>
PWR04	No. 4 Power Boiler	284 MMBTU/hr	(MACT DDDDD)*	1965
PWR05	No. 5 Power Boiler	339 MMBTU/hr	(MACT DDDDD)*	1977

\*MACT DDDDD was vacated in federal court during the preparation this permit. BART modeling for particulate matter was based on compliance with this standard, so BART PM/PM-10 limits equivalent to 0.07 pounds per million BTU are retained in this permit.

Specifications included in the permit under this Condition are for informational purposes only and do not form enforceable terms or conditions of the permit.  
(9 VAC 80-1180 D 3)

2. **Emission Controls** – Particulate matter and PM<sub>10</sub> emissions from the No. 4 Power Boiler shall be controlled by an electrostatic precipitator or an alternative control device as approved by DEQ to provide equal or greater control. The electrostatic precipitator or alternative control device shall be provided with adequate access for inspection and shall be in operation when the No. 4 Power Boiler is operating.  
(9 VAC 5-80-850, 9 VAC 5-40-7580 and 40 CFR 51.302)
3. **Emission Controls** – Nitrogen oxide (NO<sub>x</sub>) emissions from the No. 4 Power Boiler shall be controlled by low NO<sub>x</sub> burners or an alternative control technology as approved by DEQ to provide equal or greater control.  
(9 VAC 5-80-850, 9 VAC 5-40-7580 and 40 CFR 51.302)
4. **Emission Controls** – Sulfur dioxide (SO<sub>2</sub>) emissions from the No. 4 Power Boiler shall be controlled by installation of a caustic scrubber or an alternative control device as approved by DEQ to provide equal or greater control. The caustic scrubber or alternative control device shall be provided with adequate access for inspection and shall be in operation when the No. 4 Power Boiler is operating. The caustic scrubber or alternative control device shall achieve a minimum sulfur dioxide control efficiency of 90.0% at design operating rate. The scrubber or alternative control device shall be in operation no later than January 1, 2012. A performance test is required no later than 180 days after the scrubber is put into operation.  
(9 VAC 5-80-850, 9 VAC 5-40-7580 and 40 CFR 51.302)
5. **Emission Controls** – Particulate matter and PM<sub>10</sub> emissions from the No. 5 Power Boiler shall be controlled by an electrostatic precipitator or an alternative control device as approved by DEQ to provide equal or greater control. The electrostatic precipitator or alternative control device shall be provided with adequate access for inspection and shall be in operation when the No. 5 Power Boiler is operating.  
(9 VAC 5-80-850, 9 VAC 5-40-7580 and 40 CFR 51.302)

6. **Emission Controls** – NO<sub>x</sub> emissions from the No. 5 Power Boiler shall be controlled by an overfire air system or an alternative control technology as approved by DEQ to provide equal or greater control.  
(9 VAC 5-80-850, 9 VAC 5-40-7580, and 40 CFR 51.302)
7. **Emission Controls** – SO<sub>2</sub> emissions from the No. 5 Power Boiler shall be controlled by a good operation practice to minimize emissions and by firing coal to a maximum of ten percent of the annual capacity factor for this boiler. Capacity factor shall be determined on the basis of heat content of the coal fired and calculated as the ratio between the actual heat input of coal during the preceding 12-month period and the potential heat input for this boiler had it been operated for 8760 hours at the maximum steady state design heat input capacity of 2,969,900 MMBTU/yr. The capacity limit becomes effective twelve months after issuance of this permit.  
(9 VAC 5-80-850, 9 VAC 5-40-7580 and 40 CFR 51.302)
8. **Emission Control Replacement** – Future applications for the replacement of any of the required pollution control equipment cited in this permit shall include a BART cost and impact analysis, as well as a standard BACT analysis, if required.  
(9 VAC 5-80-850, 9 VAC 5-40-7590 and 40 CFR 51.302)
9. **Emission Control Operation and Maintenance** - Emission control equipment shall be maintained and operated in accordance with approved procedures which shall include, as a minimum, the manufacturer's written requirements or recommendations.  
(9 VAC 5-40-7590.5)

### **Operating Limitations**

10. **Fuel** - Coal shall meet the specifications below:

Coal burned in the No. 4 Boiler:

Maximum sulfur content per shipment: 1.8 % as  
determined by ASTM D3177, D4239, or a DEQ-approved equivalent method

Coal burned in the No. 5 Boiler:

Maximum sulfur content per shipment: 1.3 % as  
determined by ASTM D3177, D4239, or a DEQ-approved equivalent method

This condition becomes effective January 1, 2012, or on start-up of the SO<sub>2</sub> scrubber, whichever is earlier.

(9 VAC 5-80-850 and 9 VAC 5-40-7580)

### **Emission Limitations**

11. **Emission Limits** - Emissions from the operation of the No. 4 Power Boiler shall not exceed the limits specified below:

Particulate Matter	0.07 lbs/MMBtu	19.9 lbs/hr	87.0 tons/yr
PM <sub>10</sub>	0.07 lbs/MMBtu	19.9 lbs/hr	87.0 tons/yr
Sulfur dioxide		50.0 lbs/hr*	219.0 tons/yr*
Nitrogen Oxides (as NO <sub>2</sub> )		169.0 lbs/hr	740.2 tons/yr

\* Hourly SO<sub>2</sub> limits become effective 180 days after start up of the SO<sub>2</sub> scrubber, with annual limits starting July 1, 2013 or 13 months after scrubber performance test, whichever is earlier.

(9 VAC 5-80-850 and 9 VAC 5-40-7580)

12. **Emission Limits** - Emissions from the operation of the No. 5 Power Boiler shall not exceed the limits specified below:

Particulate Matter	0.07 lbs/MMBtu	23.7 lbs/hr	103.9 tons/yr
PM <sub>10</sub>	0.07 lbs/MMBtu	23.7 lbs/hr	103.9 tons/yr
Sulfur dioxide		485.1 lbs/hr	374.0 tons/yr*
Nitrogen Oxides (as NO <sub>2</sub> )		139.3 lbs/hr	610.1 tons/yr

\* effective 12 months after issuance of permit

(9 VAC 5-80-850 and 9 VAC 5-40-7580)

### **Monitoring**

13. **Monitoring Devices** – All active pollution control devices required by this permit or subsequently approved as replacements for such devices shall be equipped with one or more devices to continuously monitor the performance of the control device. Such monitors may include but are not limited to primary and secondary voltages for electrostatic precipitators and liquid flow rate and air pressure drop for the scrubber. Each monitoring device shall be installed, maintained, calibrated and operated in accordance with approved procedures which shall include, as a minimum, the manufacturer's written requirements or recommendations. Each monitoring device shall be provided with adequate access for inspection and shall be in operation when the respective emission unit is operating except for system breakdowns, repairs, calibration checks, and zero and span adjustments. The specific monitoring requirements for each pollution control device shall be addressed in the Compliance Assurance Monitoring (CAM) Plan included in each renewal of the facility's federal operating permit. Control devices required for BART compliance shall be included in the CAM Plan irrespective of the uncontrolled emission potential of the controlled emission unit. (9 VAC 5-80-850)



### **Initial Compliance Determination**

14. **Stack Test** - Initial performance tests shall be conducted for sulfur dioxide from the No. 4 Boiler to determine compliance with the emission limits and control efficiency requirements contained in Conditions 4 and 10. The tests shall be performed, reported, and demonstrate compliance no later than 180 days after start-up of the No. 4 Boiler sulfur dioxide scrubber. The details of the tests are to be arranged with the Air Compliance Manager, West Central Regional Office. The permittee shall submit a test protocol at least 30 days prior to testing. A copy of the test results shall be submitted to the Air Compliance Manager, West Central Regional Office within 30 days after test completion.  
(9 VAC 5-50-30)

### **Continuing Compliance Requirements**

15. **Stack Tests and Modeling** - Upon request by DEQ, the permittee shall conduct performance tests for particulate matter, PM<sub>10</sub>, NO<sub>x</sub>, and/or SO<sub>2</sub> from the emissions units listed in Condition 1 to demonstrate compliance with the emission limits contained in this permit. Also upon request, the permittee shall perform additional modeling to demonstrate compliance with 40 CFR 51, Subpart P or other federal requirements related to visibility impairment. The details of the tests shall be arranged with the Air Compliance Manager, West Central Regional Office.  
(9 VAC 5-50-30 G)

### **Records**

16. **On Site Records** - The permittee shall maintain records of emission data and operating parameters as necessary to demonstrate compliance with this permit. The content and format of such records shall be arranged with the Air Compliance Manager, West Central Regional Office. These records shall include, but are not limited to:
- a. Monthly and annual fuel consumption of each fuel fired in each emission unit listed in Condition 1. Fuel consumption records shall be based on a daily average feed rate.
  - b. Records of sulfur content for each shipment of coal used in the No. 4 Boiler or the No. 5 Boiler.
  - c. Measured or estimated monthly and annual particulate matter, PM<sub>10</sub>, SO<sub>2</sub> and NO<sub>x</sub> emissions of each emission unit listed in Condition 1. Estimated emissions shall be calculated by a methodology acceptable to DEQ.
  - d. The annual capacity factor for coal usage in the No. 5 Power Boiler calculated monthly, based on the annual fuel usage at the end of each calendar month.
  - e. Calculated maximum hourly emissions of each emission unit listed in Condition 1, which may be based either on measurements or engineering estimates or a combination. Maximum hourly emissions as a daily average may be acceptable on a case-by-case basis. Estimated emissions shall be calculated by a methodology acceptable to DEQ. This calculation shall be checked, at a minimum, for each semi-annual compliance certification.

- f. Details of any method used for estimation of emissions above.
- g. Monitoring records for all pollution control devices required by this permit, as specified in the facility CAM plan.<sup>1</sup>
- h. Monitoring records for all pollution control devices required by this permit, as specified in Conditions III-A-2b, III-A-2c, and III-B-3b(2) of the federal operating permit in effect on the issuance date of this permit, until such time as the federal operating permit is renewed with a CAM plan.

These records shall be available for inspection by the DEQ and shall be current for the most recent five years.

(9 VAC 5-80-900)

### **GENERAL CONDITIONS**

- 17. **Relationship to Other Requirements** - Except to the extent that conditions in this permit may be more stringent, this permit does not supersede or replace any other valid permit, regulatory or statutory requirement. Furthermore, this approval to operate shall not relieve GP Big Island, LLC of the responsibility to comply with all other local, state and federal regulations, including permit regulations.  
(9 VAC 5-80-800 D and 9 VAC 5-80-820 F)
- 18. **Federal Enforceability**- Once the permit is approved by the U.S. Environmental Protection Agency into the Commonwealth of Virginia State Implementation Plan, the permit is enforceable by EPA and citizens under the federal Clean Air Act.  
(9 VAC 5-80-800 D and 9 VAC 5-80-820 F)
- 19. **Permit Modification** - The Board may revise (modify, rewrite, change or amend) or repeal this permit with the consent of GP Big Island, LLC, for good cause shown by GP Big Island, LLC, or on its own motion provided approval of the revision or repeal is accomplished in accordance with Regulations of the Board and the Administrative Process Act (§ 2.2-4000 et seq.). Such revision or repeal shall not be effective until the revision or repeal is approved by the U. S. Environmental Protection Agency following the requirements of 40 CFR Part 51 (Requirements for Preparation, Adoption, and Submittal of Implementation Plans).  
(9 VAC 5-80-960 and 9 VAC 5-80-1000)
- 20. **Failure to Comply** - Failure by GP Big Island, LLC to comply with any of the conditions of this permit shall constitute a violation of a Permit of the Board. Failure to comply may result in a Notice of Violation and civil penalty. Nothing herein shall waive the initiation of appropriate enforcement actions or the issuance of orders as appropriate by the Board as a result of such violations. Nothing herein shall affect appropriate enforcement actions by any other federal, state, or local regulatory authority.  
(9 VAC 5-80-820 F, 9 VAC 5-80-910, and 9 VAC 5-80-1010)

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<sup>1</sup> effective upon renewal of the federal operating permit in effect at the time of issuance of this permit

21. **Right of Entry** - The permittee shall allow authorized local, state, and federal representatives, upon the presentation of credentials:
- a. To enter upon the permittee's premises on which the facility is located or in which any records are required to be kept under the terms and conditions of this permit;
  - b. To have access to and copy at reasonable times any records required to be kept under the terms and conditions of this permit or the State Air Pollution Control Board Regulations;
  - c. To inspect at reasonable times any facility, equipment, or process subject to the terms and conditions of this permit or the State Air Pollution Control Board Regulations; and
  - d. To sample or test at reasonable times.

For purposes of this condition, the time for inspection shall be deemed reasonable during regular business hours or whenever the facility is in operation. Nothing contained herein shall make an inspection time unreasonable during an emergency.  
(9 VAC 5-170-130 and 9 VAC 5-80-850)

22. **Change of Ownership** - In the case of a transfer of ownership of a stationary source, the new owner shall abide by any current permit issued to the previous owner. The new owner shall notify the Regional Director, West Central Regional Office of the change of ownership within 30 days of the transfer.  
(9 VAC 5-80-940)

23. **Permit Copy** - The permittee shall keep a copy of this permit on the premises of the facility to which it applies.  
(9 VAC 5-80-860 D)

**STATEMENT OF BASIS FOR  
DETERMINATION OF THE CONTROL OF  
VISIBILITY-IMPAIRING POLLUTANTS  
FROM**

Georgia Pacific  
Big Island, Virginia  
Registration No. 30389

**COMMONWEALTH OF VIRGINIA**  
**Department of Environmental Quality**

**INTRA-AGENCY MEMORANDUM**

**TO:** File

**FROM:** Gary Bradley  
(current contact: Lillian Alexander)

**SUBJECT:** Engineering Analysis/BART Permit Statement of Basis for  
GP Big Island, LLC (Registration # 30389)  
(Georgia-Pacific Corporation, Big Island Mill)

**DATE:** April 22, 2008

**Introduction**

This permit (i) is for the purpose of implementing the “Best Available Retrofit Technology” (BART) requirements of Article 52 (9 VAC 5-40-7550 et seq.) of 9 VAC 5 Chapter 40 (Existing Stationary Sources) of the Regulations of the Board and (ii) establishes control technology and other requirements for the control of visibility-impairing pollutants from GP Big Island, LLC in the West Central Air Quality Control Region. These BART requirements shall be the legal and regulatory basis for control of visibility-impairing pollutants from this facility.

GP Big Island became subject to requirements of BART when air dispersion modeling demonstrated a visibility impact above 0.5 deciviews on the nearby James River Face Wilderness Area. The company was required to investigate the technical feasibility and economic impact of adding or replacing control equipment on BART-subject emission units (units installed between 1962 and 1977). The BART program is authorized under the federal regional haze regulations, 40 CFR 51.300 to 308.

**Facility Description**

GP Big Island is a manufacturer of corrugating medium paper using pulp produced from recycled old corrugated containers (OCC) and semichemical pulp, and linerboard paper produced from 100% recycled OCC. This source is located in an attainment area for all pollutants, and is a PSD major source. The facility has two emission units subject to BART: the No. 4 Power Boiler and the No. 5 Power Boiler. The No. 4 Boiler is a pulverized coal boiler. The No. 5 Boiler is a multifuel stoker boiler primarily burning wood and paper waste. It operates primarily on coal only during brief periods when weather conditions make the waste stream too wet for proper combustion. All other emission units were installed or constructed prior or subsequent to the BART subject time period.

**Control Technologies – Technical Feasibility**

GP Big Island evaluated control technologies for the boilers using the required BART methodology of evaluating all control equipment that demonstrated substantial control for a particular pollutant. The possible technologies were then evaluated for technical feasibility and then for economic feasibility. For the sake of brevity, this report will not fully address lower control efficiency equipment than the control

systems proposed as BART.

Particulate Matter: For particulate matter baghouses and electrostatic precipitators (ESPs) with multiclones were both rated as 99%+ efficient, the highest rating. Both boilers presently use ESPs with multiclones for particulate control.

Sulfur Dioxide (SO<sub>2</sub>): For control of SO<sub>2</sub> emissions, wet scrubbing with caustic was the best rated technology. It has a potential control efficiency in excess of 95%. However, as the efficiency increases with a caustic scrubber, so do the costs and the potential impact on water discharge from the facility. The next best rated control technology is dry scrubbing with limestone, which has a potential control efficiency in excess of 85%. Georgia Pacific elected to utilize the more efficient caustic scrubbing and progress to an economic analysis of different options for control efficiency and treatment of one or both boilers. The report also addressed coal washing, as this technology treats the fuel stream, rather than the combustion gas stream. Parenthetically, the report did not proceed to a full analysis of lime injection but this analyst notes that it is an option that may be technologically incompatible with the use of an ESP for particulate control, depending on the electrical properties of the ash, and would probably require major modification of an existing ESP.

Nitrogen Oxides (NO<sub>x</sub>): The technologies investigated were selective reduction systems (catalytic and non-catalytic), low NO<sub>x</sub> burners, flue gas recirculation, fuel or air staging, and overfire air. All methods were technologically feasible, however the catalytic variant of selective reduction is not compatible with the proposed wet scrubber for SO<sub>2</sub> control due to rapid catalyst fouling and low NO<sub>x</sub> burners are not an option for a multi-fuel boiler (No. 5). As SO<sub>2</sub> control would reduce the visibility impact of emissions more than NO<sub>x</sub> control, no detailed economic analysis was presented for selective catalytic reduction control. The report also pointed out that there is little data available for the use of combined NO<sub>x</sub> control technologies and the technological feasibility of combined systems, while not ruled out, is questionable. Some combinations of methods are not technically feasible, for example overfire air combined with flue gas recirculation. The No. 4 Boiler presently has low NO<sub>x</sub> burners and the No. 5 Boiler presently has an overfire air system.

### **Control Technologies – Economic Feasibility**

Particulate Matter: No formal comparison of ESP and baghouse technology was submitted, but it is apparent that given the small potential improvement in control, a baghouse replacement of an existing ESP with any useful service life would not be regarded as economically feasible.

SO<sub>2</sub>: The No. 4 Boiler is a coal fired boiler while the No. 5 Boiler is a multi-fuel boiler. The report estimated the cost per ton of SO<sub>2</sub> controlled by a caustic scrubber to be \$4,297 for the No. 4 Boiler. The estimated cost per ton was \$12,371 for the No. 5 Boiler based on typical fuel sulfur content for less than 10% coal and more than 90% waste type fuel (normal mix). Based on this analysis, the caustic scrubber is economically feasible for the No. 4 Boiler but not for the No. 5 Boiler. No other control

systems were evaluated for economic feasibility for the No. 5 Boiler but given the lower control efficiencies and similar capital and operating costs of other technologically feasible controls, this analyst agrees that other active controls would be equally prohibitive economically.

The BART feasibility report did perform a detailed economic analysis of coal washing. No concise documentation for the cited coal washing charge of \$18 per ton was included but the figure seems reasonable. If the figure was slightly lower, say less than \$14 per ton then the economic feasibility becomes an issue as the cost effectiveness rivals the wet scrubber cost effectiveness for the No. 4 Boiler. However since washed coal would apply only to coal used as fuel in the No. 5 Boiler, the technical feasibility may become problematic since the size reduction from the washing process may make the coal size too small for the traveling grate in the boiler.

NO<sub>x</sub>: Georgia-Pacific presented a formal cost effectiveness calculation for selective non-catalytic reduction on both boilers. The estimate was \$9,098 per ton of NO<sub>x</sub> controlled for the No. 4 Boiler and \$10,536 per ton of NO<sub>x</sub> controlled for the No. 5 Boiler. Selective reduction is not considered economically feasible at this level of expense. Georgia-Pacific also estimated the effectiveness of adding overfire air to the No. 4 Boiler. The expense was increased by the need to retune the existing low NO<sub>x</sub> burners for the new air flow pattern. The estimated cost effectiveness of adding overfire air was \$6,489 per ton of NO<sub>x</sub> controlled. This option does not appear to be economically feasible.

### **BART Selection**

Particulate Matter: Georgia-Pacific proposes that the existing electrostatic precipitators with multiclones are appropriate particulate control for the purpose of complying with BART standards. DEQ concurs with this assessment.

NO<sub>x</sub>: Georgia-Pacific proposes that the existing low NO<sub>x</sub> burners on the No. 4 Boiler and the existing overfire air system on the No. 5 Boiler are appropriate NO<sub>x</sub> control for the purpose of complying with BART standards. DEQ concurs with this assessment, but notes that the expense of modifying the existing burners is the primary factor making the addition of overfire air prohibitively expensive on the No. 4 Boiler. For a boiler where no low NO<sub>x</sub> burners are utilized, addition of both technologies at once may have a significantly smaller economic impact.

SO<sub>2</sub>: Georgia-Pacific proposes that no control on the No. 5 Boiler and a caustic wet scrubber on the No. 4 Boiler are appropriate SO<sub>2</sub> control for the purpose of complying with BART standards. As the basis for this determination for the No. 5 Boiler was the historical fuel mixture, Georgia-Pacific proposes to restrict coal usage in the No. 5 Boiler to less than 10% of the annual fuel usage of that boiler. DEQ concurs with this assessment. Note that annual usage for coal rather than an average over a shorter period is necessary because seasonal weather conditions often make waste fuel too wet for proper combustion. At these times the No. 5 Boiler may burn mostly coal, while at most times it burns no coal at all.

### **Visibility Impact**

On a 98<sup>th</sup> percentile basis (near worst day impact), the predicted visibility impact on the James River Face Wilderness Area is an improvement from 5.0 dv to 2.8 dv. This is based on proposed SO<sub>2</sub> control by use a caustic wet scrubber with 90% control for the No. 4 Boiler and limitation of coal to 10% of annual fuel usage on the No. 5 Boiler. The more expensive control option of a 95% efficient scrubber showed a further predicted improvement of 0.17 dv over the 90% control option. The addition of selective non-catalytic reduction did not demonstrate further predicted improvement.

### **Compliance Determination**

This permit raises difficulties as to the detail of the compliance requirements, particularly monitoring, due to its incorporation into the state implementation plan (SIP). It appears to be advisable to allow substitution of a control device with equal or greater control efficiency in the permit, if for no other reason than to allow future modification of BART equipment to comply with BACT requirements, should control equipment considered BART today not be BACT by the time of a future modification. However, if that flexibility is appropriate to allow future modification, extensive specification of monitoring requirements for the present control equipment would, as a practical matter, preclude using a different type of control on such modifications. The permit addresses generally the expected monitoring of the existing control systems but does not include specific performance parameters. To retain future flexibility, this permit takes the approach of requiring all control equipment required by this permit to be subject to Compliance Assurance Monitoring (CAM) standards in the 2008 renewal of the federal operating permit for the facility, even if the control might not be subject to CAM under the federal operating permit guidelines. This approach not only applies what is regarded as the most stringent monitoring requirements presently in use, but will allow those requirements to be reviewed and revised over time. It is worth noting that if a permit similar to BART had been incorporated into the SIP as recently as ten years ago, specific monitoring requirements that were deemed appropriate at that time could conflict with present CAM methodology. For example, if a baghouse subject to monitoring requirements was in a SIP included permit in 1997, it would almost certainly include differential pressure monitoring. Ten years later, bag break detectors are considered the appropriate monitoring method. Locking differential pressure monitoring into the SIP would therefore require a source to continue use of a less reliable indicator and add the new standard. Requiring that the BART controls be subject to CAM is an appropriate method to allow both facility flexibility and strong regulatory oversight of the control equipment. A CAM plan should be in place by the time SIP revision is approved, but not until several months after issuance of the state operating permit.

The permit requires performance testing of the BART units upon request of DEQ. Record keeping is required for the fuel throughput of both boilers on a monthly basis. A record of sulfur content for each coal shipment is required. Measured or estimated emissions of particulate matter, NO<sub>x</sub>, and SO<sub>2</sub> from



each boiler are required monthly. The annualized capacity factor for coal in the No. 5 boiler is required monthly. Additionally a measurement or estimate of the maximum hourly emissions is required from each boiler to confirm that these have not increased over time from the worst case presented for this BART determination.

### **Emission Limits**

Short term emission limits in the permit are based on the short term emissions used in the associated modeling studies demonstrating visibility impacts. Annual limits are the annualized short term limits, except for the annual SO<sub>2</sub> limit on the No. 5 Boiler, which is based on the annual coal capacity limitation (calculation in application). This permit increases particulate control limits on both boilers to 0.07 lb/MMBTU based on the now vacated Boiler MACT (Subpart DDDDD), as this was the basis for the BART analysis. Previous limits were 0.21 lb/MMBTU for the No. 4 Boiler and 0.10 lb/MMBTU for the No. 5 Boiler. This permit sets SO<sub>2</sub> limits on the No. 4 Boiler at 50.0 lb/hr and 219.0 tons per year. Previous limits were 750 lb/hr with a corresponding maximum annual limit of 3,250 tons per year. This permit sets SO<sub>2</sub> limits on the No. 5 Boiler at 374.0 tons per year, based on restricted coal usage. The previous limit was 2,124.6 tons per year. No prior NO<sub>x</sub> limit was in effect for the No. 4 Boiler. This permit limits NO<sub>x</sub> to 169.0 lb/hr and 740.2 tons per year. No reduction in NO<sub>x</sub> emission limits for the No. 5 Boiler was included in this permit action. Coal sulfur limits of 1.8% for the No. 4 Boiler and 1.3% for the No. 5 Boiler were included in this permit action based on the BART permit application. Coal sulfur was not previously limited.

### **Implementation**

Reduced emission limits for particulate matter and PM<sub>10</sub> on both boilers become effective on issuance of the permit. New limits on NO<sub>x</sub> for the No. 4 Boiler become effective on issuance of the permit. Reduced annual limits for SO<sub>2</sub> on the No. 5 Boiler become effective in the twelfth month following permit issuance. SO<sub>2</sub> limits on the No. 4 Boiler become effective with the start-up of the caustic scrubber (annual emissions based on prorating until the twelfth month). BART requires implementation of control technology "as soon as practicable." Georgia Pacific has been given until January 1, 2012 to start up the new caustic scrubber on the No. 4 Boiler and an additional 180 days to demonstrate compliance with the permit limits. This will be approximately 48 months from permit issuance. DEQ views this as consistent with "as soon as practicable," based on a timetable of up to one year for analysis of whether replacement of one or both boilers is appropriate given the expense of modern controls on boilers approaching 60 years of age on the latest compliance date for BART controls. If the evaluation decides to continue use of the No. 4 Boiler, the subsequent 36 month timetable relates to one year for engineering and design, one year for fabrication, six months for installation, and six months for start up.

### **Regulatory Review and Considerations**

The facility is being permitted subject to the provisions of Article 5 (9 VAC 5-80-800 et seq.) of 9 VAC 5 Chapter 80 (Permits for Stationary Sources) and Article 52 (9 VAC 5-40-7550 et seq.) of 9 VAC 5 Chapter 40 (Existing Stationary Sources). The facility as a whole is subject to provisions of Article 6 (9 VAC 5-80-1100 et seq.) and of Article 8 (9 VAC 5-80-1605 et seq.) of 9 VAC 5 Chapter 80 (Permits for Stationary Sources). Additional requirements for the proposed installation of the caustic wet scrubber will be covered after construction details are finalized. Installation of the proposed control system will probably be conducted as a modification of an existing minor NSR permit under the Article 6 (9 VAC 5-80-1100) of 9 VAC 5 Chapter 80 (Permits for Stationary Sources) at that time. The federal regulation pertinent to this action is 40 CFR 51 Subpart P, Protection of Visibility.

### **Public Participation**

Public comment is required for the state operating permit because it will be submitted as a SIP revision. The Compliance Assurance Monitoring plan will not be formulated for this comment period but will be subject to public comment at the next federal operating permit renewal.

### **Notification of Other Government Agencies**

No standard notification practice has been set for BART permits. USEPA and local officials will be notified using procedures similar to the PSD permit notification procedures. Federal Land Managers will be given a sixty day consultation period for the SIP revision which includes this permit prior to the public hearing.

### **Recommendation**

It is recommended that the permit be approved.

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